

**Virginia Electric And Power Company
Surry Power Station
5570 Hog Island Road
Surry, Virginia 23883**

March 14, 2003

**U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555-0001**

**Serial No.: 03-229
SPS: JCS/BAG R1
Docket No.: 50-280
License No.: DPR-32**


Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to Surry Power Station Unit 1.

Report No. 50-280/2003-001-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to the Management Safety Review Committee for its review.

Very truly yours,



**Richard H. Blount, Site Vice President
Surry Power Station**

Enclosure

Commitments contained in this letter:

1. A Root Cause Evaluation (RCE) was initiated to determine the cause of this event. The approved recommendations from the RCE necessary to prevent recurrence will be implemented.
2. Unit 2 RCP level switches will be functionally tested and the reactor coolant pumps will be inspected for evidence of oil leakage during the next refueling outage. Corrective actions will be implemented as appropriate.

IE22

cc: United States Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23 T85
Atlanta, Georgia 30303-8931

Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)

SURRY POWER STATION, Unit 1

DOCKET NUMBER (2)

05000 - 280

PAGE (3)

1 OF 4

TITLE (4)

Manual Reactor Trip Due To Degraded Conditions On "C" Reactor Coolant Pump

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCUMENT NUMBER
01	14	2003	2003	- 001 -	00	03	14	2003	FACILITY NAME	DOCUMENT NUMBER
										05000-

OPERATING
MODE (9)

N

POWER
LEVEL (10)

100 %

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)

20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
20.2203(a)(1)	50.36(c)(1)(i)(A)	X 50.73(a)(2)(iv)(A)	73.71(a)(4)
20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER
20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 368A.
20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)	
20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	
20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

Richard H. Blount, Site Vice President

TELEPHONE NUMBER (Include Area Code)

(757) 365-2000

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	AB	MO	W893	Yes					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

At 0137 hours on January 14, 2003, Surry Unit 1 Reactor was manually tripped from 100% power due to degrading conditions on the Reactor Coolant Pump (RCP) 'C'. The operating crew received alarms indicating elevated shaft vibrations with the RCP 'C' motor followed by indications of increased lower radial bearing temperatures. In accordance with approved procedures, the operating crew manually tripped the reactor and secured the RCP 'C'. Automatic actuations occurred as expected, including Turbine Trip by Reactor Trip, Auxiliary Feedwater initiation, Main Generator Trip, and AMSAC initiation. The motor lower radial bearings on RCP 'C' were replaced and the unit was returned to service. A root cause evaluation was initiated to determine the cause of the high bearing temperatures and high shaft vibrations and to address actions to preclude recurrence. This is a reportable event pursuant to 10CFR50.73(a)(2)(iv)(A) since the event resulted in manual actuation of the reactor protection system and the initiation of the Auxiliary Feedwater system.

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		YEAR 2003	SEQUENTIAL NUMBER -- 001--	REVISION NUMBER 00	

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

1.0 DESCRIPTION OF THE EVENT

On January 14, 2003, at 0126 hours with Surry Unit 1 operating at 100 percent power, a Reactor Coolant Pump (RCP) 1C Shaft Alert annunciator [EISS-AB-MO-ANN], a RCP Shaft Danger annunciator, and high motor lower radial bearing temperature alarms [EISS-AB-MO-TA] were received in the Main Control Room [EISS-NA]. The operating crew entered the appropriate abnormal procedure and began monitoring related RCP parameters to validate the alarms. The motor lower radial bearing temperature on RCP 'C' increased to approximately 403 degrees Fahrenheit (F) and the 'C' motor cubical rate of rise temperature alarm was received on the plant computer. The operating crew confirmed the validity of the condition and initiated a manual reactor trip at 0137 hours. Following the reactor trip, the affected RCP was secured at 0138 hours. Automatic actuations occurred as expected, including Turbine Trip by Reactor Trip, Auxiliary Feedwater [EISS-BA] initiation on low low steam generator [EISS-SG] level, Main Generator Trip, and AMSAC initiation. Individual Rod Position Indicator (IRPI) [EISS-AA-ZI] E-11 initially indicated 25 steps and normal boration was initiated to meet the required shutdown margin. At 0400 hours, IRPI E-11 indication was observed to drift to approximately 12 steps.

A four-hour and an eight-hour non-emergency report were made to the NRC as required by 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72(b)(3)(iv)(A). This report is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) for a manual actuation of the reactor protection system and the initiation of the Auxiliary Feedwater system.

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

This event resulted in no significant safety consequences or implications. The reactor was manually tripped prior to securing the affected RCP in accordance with station abnormal procedures. Auxiliary Feedwater automatically initiated on low low steam generator level following the trip. As a result of the loss of turbine load, the secondary power operated relief valves [EISS-SB-RV] actuated during the transient. The Reactor Coolant System (RCS) [EISS-AB] cooled to a minimum Tave temperature of approximately 543 degrees F and then stabilized to the no load Tave value of 547 degrees F. Therefore, the health and safety of the public were not affected.

The operating crew noted the one IRPI indication and in accordance with emergency operating procedures, initiated normal boration and calculated the required shutdown margin. At 0517 hours, the boron concentration was verified to be greater than the amount required, ensuring adequate shutdown margin.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

3.0 CAUSE

The direct cause for the Main Control Room indications and alarms resulting in the manual trip of the unit was the degrading conditions of RCP 'C'. A slow loss of oil in the RCP motor lower oil reservoir resulted in the failure of the motor lower radial bearing causing elevated temperatures and high shaft vibrations.

During the initial inspection of the RCP 'C', no oil level was observed in the motor's lower reservoir sight glass. The motor was uncoupled and moved to the operating deck of containment where the lower bearing was disassembled and inspected. The drainpipe flange, the aluminum oil pan joint, and the level column drain cap were identified as potential sources of oil leakage. A 1/4 inch misalignment was found on the reservoir's drainpipe flange. None of the sources could be positively identified as the point source. The lower radial bearing assembly was removed and all six bearing shoes were found damaged.

A Root Cause Evaluation (RCE) team was assembled to determine the root cause and to address actions to preclude recurrence. Preliminary findings also indicate that the RCP motor radial bearing failure can be attributable to the loss of lubrication in the lower RCP motor radial bearing. In addition, the RCE team found that the lower oil reservoir level switch failed to actuate and alert the operating crew on low reservoir level due to a broken internal spacer plate bracket. No adverse trend or alarm in the lower radial bearing resistance temperature detector (RTD) temperature was noted preceding the event because the RTD was not in direct contact with the bearing shoe as required by the manufacturer's drawing.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

The damaged radial bearing was disassembled, inspected, and replaced. Internal components, parts and gaskets were installed in accordance with the assembly procedure and vendor recommendations. The lower radial bearing RTD was replaced and installed in accordance with the manufacturer's drawings. The lower oil reservoir gaskets and seals were replaced, and the drainpipe flange misalignment was corrected. During corrective maintenance, strong backs were installed for the RCP 'C' aluminum oil pan fasteners to eliminate further leakage. Oil levels were adjusted as necessary.

Post maintenance testing was completed, and the lower reservoir was inspected for leaks prior to returning the pump motor to service.

5.0 ADDITIONAL CORRECTIVE ACTIONS

Due to the findings in the RCP 'C' motor, oil level alarms for the other Unit 1 RCPs were

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

functionally tested. The RCP 'B' upper oil reservoir level switch failed its functional test. Upon inspection, the same failure mechanism as the RCP 'C' lower switch was identified. All unit 1 level switches were inspected and the two defective switches were replaced.

6.0 ACTIONS TO PREVENT RECURRENCE

Unit 2 RCP level switches will be functionally tested and the RCPs will be inspected for evidence of oil leakage during the next refueling outage and corrective actions will be implemented as appropriate.

Additional actions to prevent recurrence that are identified by the RCE will be tracked through the corrective action system.

7.0 SIMILAR EVENTS

None

8.0 MANUFACTURER/MODEL NUMBER

Westinghouse/CS VSS Reactor Coolant Pump Motor

9.0 ADDITIONAL INFORMATION

Unit 2 was not affected by this event and remained stable at 100% reactor power.